

## REMARKS

The present application includes pending claims 1-17. Claims 9-17 have been withdrawn from consideration. Claims 1-6 stand rejected, while claims 7 and 8 have been objected to. By this Amendment, claim 1 has been amended, while new claim 18 has been added. The Applicant respectfully submits that the pending claims define patentable subject matter.

Claims 7 and 8 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The drawings were objected to because the “x-ray imaging device,” the “means for determining the location,” and the “means for recording” were not shown. The present application, however, incorporates United States Patent Nos. 5,772,594 and 6,285,902 by reference. *See* present application at Para. [0003]. Claim 1 has been amended to recite a “computer” that includes the “means for determining the location,” and the “means for recording.” The Applicant respectfully submits that the features noted in the drawing objection are shown and described in United States Patent No. 6,285,901, for example, which is incorporated by reference. Thus, the Applicant respectfully requests reconsideration of the drawing objections.

Claim 1 was objected to because a “computer” was not set forth in the body of the claim. Claim 1 has been amended as set forth above to recite a “computer,” thereby overcoming this claim objection.

Claims 1-3 stand rejected under 35 U.S.C. 112, second paragraph. As noted above, claim 1 has been amended to include a “computer,” which includes the “means for

determining,” and “means for recording.” Thus, the Applicants respectfully request reconsideration of the claim rejections.

Additionally, claim 1 has been amended by deleting “drill guide” and inserting “surgical instrument,” as noted by the Examiner. The Applicant thanks the Examiner for noticing this minor claim drafting error.

Claims 1-3 stand rejected under 35 U.S.C. 102(e) as being anticipated by United States Patent No. 6,285,902 (the “’902 patent”). Claim 1 also stand rejected under 35 U.S.C. 102(e) as being anticipated by United States Patent Application Publication No. 2001/0034530 (the “’530 application”). Claims 4-6 stand rejected under 35 U.S.C. 102(e) as being anticipated, or rendered obvious, by the ‘902 patent. Claims 1-3 also stand rejected under 35 U.S.C. 103(a) as being unpatentable over United States Patent No. 6,477,400 (“Barrick”) in view of United States Patent Application Publication No. 2002/0095083 (“Cinquin”). The Applicant respectfully traverses these rejections at least for the reasons discussed below.

The Applicant first turns to the rejection of claims 1-3 as being anticipated by the ‘902 patent. The ‘902 patent relates to “a system for providing visual feedback regarding surgical tool positioning with respect to fluoroscopic images of a body part during an orthopaedic procedure.” ‘902 patent at column 1, lines 15-18. The embodiments shown in the ‘902 patent “superimpos[e] representations of tools being used in the surgical field over the images of the body part such that real-time tool position feedback is provided to the surgeon.” *Id.* at column 4, lines 8-12.

The ‘902 patent discloses a system and method in which the position of the tool itself is monitored. “Another feature of the invention is a surgical tool outfitted with a

plurality of localizing emitters such that its pose can be continuously measured by a localizing device....” *Id.* at column 4, lines 47-49. “The system controller 121 then displays on the system monitor 122 the images of the patient’s anatomy superimposed with representations of the surgical tool 128 at its current pose.” *Id.* at column 8, lines 4-7. “In accordance with the invention, the representation of the surgical tool must accurately relate to the tool itself.” *Id.* at column 15, lines 12-14.

The ‘902 patent discloses a system in which only the actual trajectory of an instrument is displayed.

In the preferred embodiment, two points defining the trajectory of the bore 182 of a drill guide 128 are found by means of a calibration procedure that employs calibration shafts 184, 185 and the optical localizer 120.

*Id.* at column 15, lines 27-31.

The pose of the drill guide 128 is measured 205 by the optical localizer 120, a representation of the tool at that pose is calculated 206, is passed through the conic projection model 207 and the mapping model 208 and then superimposed on the appropriate image. For each image acquired, a separate graphic representation of the trajectory is thus generated if the drill guide’s trajectory passes the volume in space where the x-ray passed when that image was acquired.

*Id.* at column 17, lines 25-33.

The ‘902 patent discloses a system that displays a representation of the actual position of the tool. It does not, however, teach or suggest “determining the location of one or more virtual trajectories relative to the real trajectory, wherein the one or more virtual trajectories represent *possible positions* of components used during a surgical

operation,” as recited in claim 1. The ‘902 patent simply does not teach, nor suggest, “virtual trajectories representing possible positions of additional components.” Further, the ‘902 patent also does not teach, nor suggest, “superimposing graphic representations of the real and virtual trajectories over the at least one 2-D image of the body part,” as recited in claim 1. Thus, at least for these reasons, the Applicant respectfully submits that the ‘902 patent does not anticipate claims 1-3.

The Applicant next turns to the rejection of claim 1 as being anticipated by the ‘530 application. The Office Action cites Figure 27 of the ‘530 application as support for “virtual” trajectories. The ‘530 application states the following with respect to Figure 27:

With reference to FIG. 27, upon actuation of the operation button 2604 the information section 1904 includes an operation panel 2702. The operation panel 2702 include a trajectory section 2704, a virtual tip section 2706....

The virtual tip feature allows the operator to virtually extend the tip of the smart instrument 102 on the instrument during operation. The virtual tip section 2706 includes a distance text box 2726, a decrementing button 2728, an incrementing button 2730 and a reset button 2732. The distance text box 2726 contains the virtual extended distance of the smart instrument....

‘530 application at Paras. [0152] – [0155]. Notably, the “virtual tip” feature relates to the tip of the instrument, that is, a representation of the actual tip of the instrument itself, but not “virtual trajectories representing possible positions of components used during a surgical operation.” The ‘530 application discloses virtual representations of the actual tip, but not possible positions of components, such as additional guide pins required in a surgery, used during a surgical operation. Thus, the Applicant respectfully requests reconsideration of the rejection of claim 1 as being anticipated by the ‘530 application.

The Applicant next turn to the rejection of claims 4-6 as being anticipated or rendered obvious by the '902 patent. The '902 patent simply does not teach, nor suggest, said "virtual trajectories having fixed and known relationships to the real trajectory and representing *possible positions* for subsequent real trajectories" used in a surgical procedure, at least for the reasons discussed above. Further, the '902 patent does not teach, nor suggest, "superimposing the representations of the real trajectory and virtual trajectories over the at least one x-ray image of the bone." Thus, at least for these reasons, the Applicant respectfully submits that the '902 patent does not anticipate or render obvious claims 4-6 of the present application.

The Applicant next turns to the rejection of claims 1-3 as being unpatentable over Barrick in view of Cinquin. The Office Action concedes that Barrick does not teach, nor suggest, a "virtual trajectory." As such, it relies on Cinquin to overcome this deficiency. Cinquin, however, does not teach, nor suggest, "virtual trajectories representing possible positions of components used during a surgical operation." Instead, it discloses tracking the actual tool itself.

It may, furthermore, be provided for a marking element to be associated with a tool or a tool jig, the orientation of this element being determined by the measuring device so that signals corresponding to this orientation are transferred to the data processing system. The data processing system thus receives not only the position signals of the bones but also the position signals of the tool or tool jig and so the relative positioning can be monitored and, where applicable, controlled.

Cinquin at Para. [0044]. In particular, a "sawing jig 28 likewise bears a marking element 29 and so the position of the sawing jog 28 in the space can also be determined at any

time via the data processing system 25.” *Id.* at Para. [0067]. Cinquin does not teach or suggest “determining the location of one or more virtual trajectories relative to the real trajectory, wherein the one or more virtual trajectories represents possible positions of components used during a surgical operation,” as recited in claim 1. Cinquin simply does not teach, nor suggest, “virtual trajectories representing possible positions of components.” Further, Cinquin also does not teach, nor suggest, “superimposing graphic representations of the real and virtual trajectories over the at least one 2-D image of the body part,” as recited in claim 1. Thus, at least for these reasons, the Applicant respectfully submits that Cinquin does not anticipate claims 1-3.

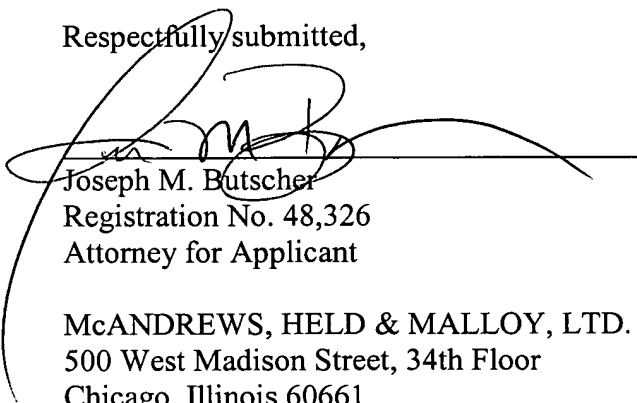
With respect to claim 2, the Applicant respectfully submits that none of the cited references teach or suggest “virtual trajectories [that] represent future possible drill guide trajectories.”

The Applicant respectfully submits that new claim 18 defines patentable subject matter. No fee is believed due with respect to new claim 18 because the present application now includes less than twenty total claims, and less than three independent claims, because claims 9-17 have been withdrawn from consideration.

The Applicant respectfully submits that claims 1-8 and 18 of the present application should be allowable at least for the reasons discussed above. If the Examiner has any questions or the Applicant can be of any assistance, the Examiner is invited to contact the undersigned at the number listed below. No fee is believed due with respect to this Amendment. The Commissioner, however, is authorized to charge any necessary fees or credit any overpayment to Account No. 07-0845.

Respectfully submitted,

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